

## WHAT IS CLAIMED

1. A plant for producing, conveying and packaging articles, in particular articles in the form of rolls, such as rolls of paper material and the like; comprising at least an apparatus for forming articles positioned upstream, which has at least a local control  
5 unit comprising processor means operating under the control of a predefined program which governs the operation of said forming machine in response to corresponding setting data which are provided to said processor means of the forming machine; at least a packaging machine positioned downstream, which is able to package said articles and has at least a respective local control unit  
10 comprising processor means operating under the control of a predefined program that governs the operation of said packaging machine in response to corresponding setting data which are provided to said processor means of the packaging machine; and an apparatus for conveying the rolls which is able to transfer said rolls between said forming machine and said packaging machine and which presents at least a  
15 respective local control unit comprising processor means operating under the control of a predefined program that governs the operation of said conveying apparatus in response to set data input into said processor means of the conveying apparatus, wherein a central control unit is provided which has a program for determining operating parameters of the plant, which, starting from predefined setting data  
20 provided to said central unit and relating to a desired operation of the plant, provides, for the respective microprocessor means of the local control units, corresponding data for setting the operation of said upstream forming machine, of said downstream packaging machine and of said conveying apparatus.
2. A plant as claimed in claim 1, wherein said forming machine positioned upstream  
25 comprises a cutting machine able to cut said rolls from respective elongated coils.
3. A plant according to claim 1, wherein said plant has for each of said downstream operative machines at least a respective successive machine for sacking said packs whereto it sends the treated packs, and wherein each sacking machine comprises a  
30 corresponding electronic processing unit which controls its operation, said central processing unit controls, through the corresponding control unit, the operation of each sacking machine.

4. A plant as claimed in claim 1, wherein said plant has at least a palletization machine where to at least a sacking machine or a packaging machine sends the packs or sacks to be palletized, and wherein said palletization machine comprises a corresponding electronic processing unit which controls its operation, said central processing unit controls, through the corresponding control unit, the operation of said palletization machine.
5. A plant as claimed in claim 4, wherein means for directly conveying the treated articles are provided between each packaging machine and said palletization machine.
6. A plant as claimed in claim 1, wherein said central control unit is defined by one of the local control units of the plant.
7. A plant as claimed in claim 1, wherein said apparatus for conveying said rolls comprises one or more longitudinal segments for advancing the rolls, each of which has respective motor advancing means, and wherein said central control unit directly controls the operation of said motor means of each longitudinal advance segment of said apparatus for conveying said rolls.
8. A plant as claimed in claim 1, wherein said local control units of the upstream and downstream operative sections are in the form of a PLC or a PC, in that the local control unit of each successive operative machine is in the form of a PLC or a PC, in that the local control unit of the terminal operative machine is in the form of a PLC or a PC and wherein said central processing unit is in the form of a PLC or a PC.
9. A plant as claimed in claim 1, wherein in order to determine the operation of the plant: the type of format to be produced is set; for each work section the hypothetical working rate corresponding to the maximum operating rate in relation to said format is determined; for each work section, the hypothetical working rate is compared to the working rate of the downstream sections to determine a critical section defined as that section in which the hypothetical working rate, for that format, is lowest relative to the corresponding hypothetical working rates of the other sections; and hence the actual working rates of the sections of the plant are determined in such a way that said rates are lower than the respective maximum rates and are not such as

to feed or obtain, in correspondence with the critical section, a quantity of articles exceeding the quantity corresponding to the maximum working rate achievable in this section for that format.

10. A plant as claimed in claim 1, wherein the actual working rates of the plant sections are determined in such a way that said rates are such as to feed or obtain, in correspondence with the critical section, a quantity of articles equal to or substantially equal to the quantity corresponding to the maximum working rate achievable in this critical section for said set format.
11. A plant as claimed in claim 1, wherein, when a change is detected in an operating parameter of at least one of the sections of the plant, in particular when an event occurs which determines the operation of that section to be stopped, the operating state of the other sections of the plant is verified, and a procedure for rearranging the operation of the plant is determined, according to said operating state of the other sections of the plant.
12. A plant as claimed in claim 11, wherein the rearranging procedure provides, if the magazine holding the pieces or elongated coils has a number of pieces below a predefined level, in case of interruption of the feeding of articles to one of said downstream work sections without decreasing the working rate of the upstream machine, for continuing the operation until the magazine is completely emptied.
13. A plant as claimed in claim 11, wherein the rearranging procedure provides, if the other section of the plant is able to increase its operating rate, in case of interruption of the feeding of articles to one of said downstream work sections without decreasing the working rate of the upstream machine, for increasing the working rate of the other second downstream operative machine and for causing all the rolls to be deviated onto the conveying means of said operative machine.
14. A plant as claimed in claim 11, wherein the rearranging procedure provides, in case of interruption of the feeding of articles to one of said downstream work sections without decreasing the working rate of the upstream machine, for inhibiting the cutting of the elongated coils destined to the downstream section under conditions of stopped operation.

15. A plant as claimed in claim 11, wherein the rearranging procedure provides, if the downstream section is under conditions of missing load, to increase the conveying velocity of the conveying apparatus.
- 5 16. A plant as claimed in claim 1, wherein said central processing unit comprises display means for setting the operating data of the plant and for illustrating the operating state of the sections of the plant.
- 10 17. A plant as claimed in claim 1, wherein the conveying apparatus has at least a motorization stage comprising at least a first and a second motor able to actuate respective parallel conveyor belts, said first and second motors being commanded in such a way as to actuate the respective conveyor belts at slightly different speeds in such a way as to allow the conveyed articles to travel substantially parallel to each other.
- 15 18. A plant for producing and packaging articles, in particular rolls, such as rolls of paper material and the like, said plant comprising the following operative sections: and apparatus for forming articles having a first and a second cutting sections which are able to cut the articles in the form of rolls from respective elongated coils, said cutting units sending the articles to respective machine for packaging the articles downstream therefrom, said cutting sections being fed with elongated coils coming from a single coil magazine fed by a single re-coiling section; wherein it comprises a control unit such that, when an event that determines the operation of one of the cutting sections to be stopped is detected, it verifies the operating state of the other cutting section of the plant, and determines a procedure for rearranging the operation of the plant; and wherein said rearranging procedure provides, if the other section of the plant is able to increase its operating rate, for increasing the operating rate of the second cutting section in such a way as to absorb at least partially the load of coils that are no longer processed by the cutting section under conditions of stopped operation.
- 20 25 30 19. A conveying apparatus which feeds said articles coming from said upstream operative machine to at least a respective downstream operative machine, according to claim 1.